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# NEWSLETTER

## NATIONAL CLONAL GERMPLASM REPOSITORY

33447 Peoria Road  
Corvallis, Oregon 97330  
(503) 757-4448  
Kim E. Hummer, Curator

October 1987

### New Accessions at the Repository

We began the spring by receiving about 370 seedlots of fruit, nut, and related species from the Hortus Botanicus Academiae Scientiarum in Taschkent. We gratefully acknowledge the receipt of this seed. Many of these seeds are native to the Soviet Union.

Three plant collectors, Mark Widriechner, Maxine Thompson, and Nancy Fredricks have been actively collecting native plant material for NCGR-Corvallis. They have collected for us in north eastern Oregon, Colorado, and the mid-west. Many species formerly not in our collection were obtained, including:

*Ribes cynosbati*  
*R. hudsonianum* var. *pedicellare*  
*R. irriguum*  
*R. leptanthum*  
*R. mogolicum*  
*R. speciosum*  
*R. wolffii*

*Rubus alumnus*  
*R. pergratus*  
*Vaccinium*  
*V. angustifolium* var. *nigrum*

The ranges were expanded for many other native species already residing in the collection.

We have received several long awaited *Rubus* cultivars including 'Ebano', 'Tumelberry', 'Sunberry', 'Autumn Bliss', 'Bedford Thornless' and 'Red Antwerp'.

We are looking forward to two plant collecting trips for the summer of 1988, pending funding approval. Dr. Maxine Thompson will be collecting fruit and nut species in Pakistan for the National Germplasm System. The region that she will be visiting is along the old trade routes from Europe to Asia. Very little fruit or nut germplasm from this region presently exists in the United States.

Another collection trip will be conducted in the Northern Rocky Mountains and Big Horns next summer by Dr. Jim Hancock and Dr. Jim Luby. Native *Fragaria*, *Ribes*, *Rubus*, and *Vaccinium* will be collected.

We have recently published a listing of Available Accessions at our Repository. We will be happy to distribute this list to interested researchers. We also have separate sheets for those interested in one or two genera. We will update these lists each September.

### Staffing Changes

On April 3, 1987, Dr. Harry Lagerstedt retired from the position of Research Leader for NCGR-Corvallis. Dr. Lagerstedt served 20 years for the USDA/ARS as a horticulturist. He retired to a personal farming venture with peaches and filberts. Dr. Otto Jahn also retired in April 1987. Dr. Jahn was the first curator for our facility. He came to Corvallis in 1979 to oversee the construction. We wish personal happiness and good luck to Harry and Otto, who provided the early leadership for the repository.

Dr. Mel Couey, a post harvest physiologist at Hilo, HA, will become the new Research Leader beginning October 26, 1987. Dr. Kim Hummer, who was formerly the Research Associate for information management at the repository, became curator beginning May 11, 1987.

Funding for the repository is now solely from USDA/ARS. Because of this change, four previously state-employed members of the technical staff, BJ (Disney) Rebhuhn, Patricia Robbins, Joe Snead, and Joseph Postman, became federal employees with equivalent responsibilities.

Three state scientists, Dr. Larry Daley, Dr. Barbara Reed, and Jim Chandler, are working under special cooperative agreements with the repository. These appointments are through the Oregon State University, Department of Horticulture.

### Staff

M. Couey, Research Leader, USDA - ARS  
K. Hummer, Curator, USDA - ARS  
L. Daley, Plant Physiologist, Horticulture, OSU

B. Reed, Post Doctorate Research Assoc. Horticulture, OSU

P. Benoist, Secretary, USDA - ARS

J. Chandler, Experimental Bio. Technician, Horticulture, OSU

BJ (Disney) Rebhuhn, Plant Physiologist, USDA - ARS

J. Postman, Plant Pathologist, USDA - ARS

P. Robbins, Plant Propagation, USDA - ARS

J. Snead, Farm Manager, USDA - ARS

H. Lagerstedt, Collaborator, Former Research Leader, USDA - ARS

M. Westwood, Collaborator, USDA - ARS

### GRIN

We have 3744 accessions for our major genera loaded on GRIN. We began loading inventory information but had a problem in that some of the information we keep, and are asked about by our user community, had no adequate variables in GRIN.

At the end of May, Clonal sites met with the GRIN team, Dr. Shands, Dr. Stoner, and Dr. George White to discuss this problem. The GRIN team is modifying the data base to better accommodate clonal needs. Now that our data conflicts have been straightened out we will continue loading inventory information.

We have begun loading our plant distribution requests into the order processing module.

We have electronically entered data on *Fragaria* flowering, fruiting, and general plant descriptors for 1985, 1986, 1987; *Pyrus* flowering, fruiting, general plant descriptors; and cold hardiness, *Corylus* flowering, general plant descriptors, and electrophoretic separation patterns. As soon as descriptor variables are approved and loaded to GRIN, we will load our data for these genera.

### Plant Distribution

We had 107 requests for plant material in 1986. Patricia Robbins, our technician in charge of distribution, sent out 361 plant accessions to 14 foreign countries and 27 States within the USA. This coming year will probably see an increase of plant distribution. We have had 140 plant requests since January 1987.

### Cryopreservation Research Summary\*

By Dr. Barbara Reed

Cryopreservation work for the summer centered around the testing of *Fragaria* cultivars for their cryopreservation potential. During July, visiting FAO scientist, Mr. Antonio de Miranda of Brazil, studied in our lab. Mr. Miranda practiced cryopreservation techniques as well as learning theoretical aspects through reading and discussion.

Several *Pyrus* accessions are being tested for storage potential in liquid nitrogen. Some show promise of high survival rates. *Rubus* survival rates have been greatly increased by several new techniques. I presented a poster on methods used for *Vaccinium* cryopreservation at the June meeting of the Society for Cryobiology in Edmonton, Alberta, Canada.

## Virus Testing of Pears ☞

By Joseph Postman

Testing of the NCGR pear collection for latent viruses began in 1983. Superior virus indicators have now been incorporated into the program. Presently, all pear accessions are tested by graft inoculation of greenhouse grown Nouveau Poiteau and *Pyronia veitchii* trees. By using these two indicators, Pear Vein Yellow Virus, Ringpattern Mosaic (= Apple Chlorotic Leafspot Virus), some latent quince viruses and possibly Apple Stem Grooving Virus can be detected. Stony Pit Virus, which produces only fruit symptoms, is tested by top-working a limb of each of our field trees with the Bosc indicator. Many Bosc limbs began bearing fruit in 1987, and will be observed for several years for evidence of Stony Pit Virus. No Stony Pit symptoms have been observed this year.

ELISA testing was attempted for Apple Stem Grooving Virus and Apple Chlorotic Leafspot Virus, however the bioassays appear to be more reliable than the ELISA tests for these particular viruses.

Viruses in pear are not known to be spread in nature, nor are they known to be transmitted through the seed stage. The only known vectors of pear viruses are plant propagators, who transmit the viruses by grafting. Thus pear clones that originated as seedlings in the not too distant past tend to have fewer viruses than old cultivars that have been clonally propagated for decades or centuries. Pear clones in the NCGR collection that represent wild species germplasm tend to be in the former group. In the following table, the virus status of the *Pyrus* collection is summarized.

Virus Status	Species	Cultivar
Virus Positive	14.4%	61.4%
Virus Negative	80.5%	37.6%

Not included in the above table are the virus negative plants that have been generated by heat treatment and micro-propagation at NCGR-Corvallis. To date 347 clones (66.9% of the known virus infected accessions) have been successfully heat treated and micro-propagated. 288 of these have been retested virus negative and will soon replace the virus infected greenhouse plants. Infected field plants will be retained pending verification of the identities of the new virus negative plants. The day is not far away when all *Pyrus* germplasm in the NCGR collection is free of important virus diseases.

## Cold Hardiness \*

Dr. Jose Montano, a post-doctoral researcher who recently completed his program at NCGR-Corvallis, evaluated 800 *Pyrus* accessions for maximum mid-winter cold hardiness. He used differential thermal analysis and visual browning to determine the lowest survival temperatures of xylem and cambium. He has prepared a manuscript entitled "Differential Thermal Analysis for Large Scale Evaluation of Pear Cold Hardiness" which is IN PRESS in *HortScience*. His data has been entered electronically and will soon be available through the Germplasm Resource Information Network (GRIN).

## In Vitro Culture

by B. J. (Disney) Rebhuhn

With the end of the growing season approaching, the tissue culture lab is busy taking the last explants of the season, disinfecting them and starting cultures from the cuttings. We are gathering material from the strawberry, raspberry, blueberry, and pear collections, focusing on those species and cultivars which are not yet in vitro. We have also just completed yearly maintenance transfers of the strawberry and raspberry 4 degree C collections. This is the first year that we are maintaining a pear cold storage collection, with over fifty cultivars and species successfully started and in holding.

The propagation and rooting of woody plants remains a challenge and other ongoing experiments address this problem. We are testing several new media, a new cytokinin, and different rooting protocols and media on the more difficult to propagate genera (e.g. filberts, blueberries and chestnuts).

Progress continues in heat treatment and meristem culture to eliminate virus infection. We are accruing cultures of raspberries, pears, strawberries and filberts for rooting and retesting. With a new dissecting stereomicroscope we hope to improve our success rate.

Genus	% of Collection in vitro
<i>Corylus</i>	1.5
<i>Fragaria</i>	33.6
<i>Pyrus</i>	8.1
<i>Rubus</i>	23.3
<i>Vaccinium</i>	5.0

## Herbarium ☞

We have initiated an herbarium collection at the repository to house examples of each species for our assigned genera. We are requesting collectors to provide voucher specimens for seed lots whenever possible. We will provide herbarium labels to standardize the collection information. When voucher specimens are not available from the collection site, seedlings will be grown in Corvallis to verify the seedlot and be used as vouchers.

## Library of Nursery Catalogs ☞

We feel that the repository is not only a center for plant germplasm maintenance but should house the information that goes along with each of the assigned genera. To that end, we have established a collection of nearly 200 catalogs of U.S. and foreign nurseries that produce pears, filberts, and small fruits. We have entered the addresses for these nurseries and categorized them by the crops that they produce. With further time and resources specific cultivars could be entered for each nursery. We are continuing to develop source lists of cultivars of researchers, breeders, and private collectors who maintain plants of our genera. Information on these alternate sources of germplasm will be useful in planning for cultivar vulnerability and availability.

## Field Collection

Joe Snead, our field manager, will be enlarging our present pear field collection by about 1 acre. He has prepared the land for installation of additional irrigation and started turf between rows. This planting will bring our total pear field to about 14 acres. We have about 2300 pears in the field. This space will be inadequate in coming years unless management practices are changed.

We will be establishing a separate *Ribes* field planting this year. These plants were formerly established between *Rubus* rows. Their removal will allow for an organized expansion of the rapidly increasing *Rubus* collection.

New plant labels have been placed in the *Rubus*, *Ribes*, and *Corylus* field collections. These labels include large typeset names that are legible from the next row over. The labels also include barcode for fast inventory and evaluation data collection.

## Publications

The following publications originating at NCGR-Corvallis have been or will be published soon

Aunand, Z., L.S. Daley, R.A. Menendez, and H. B. Lagerstedt. 1987. Characterization of filbert (*Corylus*) species and cultivars using gradient polyacrylamide gel electrophoresis. *J. Environ Hort* 5(1):11-16.

Daley, L.S. and K. C. Nichols. 1987. Apparatus and computer program to obtain activation energies of photosynthesis. Example of studies in pear varieties. *Plant Physiology and Biochemistry* (previously *Physiologie Vegetale*) IN PRESS

Daley, L.S., P. J. Breen and P. Mohanty. 1987. Measurement of biological changes by fourth-derivative visible spectroscopy of leaf lamina. *Spectroscopy* 2(3):32-35.

Daley, L.S., R.A. Menendez and R.L. Stebbins. 1987. Identification of red-fruited pears by electrophoresis and fourth derivative spectroscopy of intact lamina of pear leaves. *J. Environ Hort* 5:25-28.

Jeong, B-R, L.S. Daley, J. Postman, W.M. Proebsting, and F.J. Lawrence. 1987. Changes in chlorophyll-protein complexes associated with June yellows of strawberry. *Photochemistry and Photobiology Pathology*. IN PRESS.

Montano, J., M. Rebhuhn, K. Hummer, and H. Lagerstedt. 1987. Differential Thermal Analysis for Large Scale Evaluation of Pear Cold Hardiness. *HortScience*. IN PRESS

Reed, B. and H.B. Lagerstedt. 1987. Freeze Preservation of Apical Meristems of *Rubus* in Liquid Nitrogen. *HortScience* 22(2):302-303.

## Visitors

We have had more than 350 visitors to the repository thus far in 1987. We were fortunate to have participated in the annual meeting of the North American Fruit Explorers (NAFEX) in August. Many NAFEX members have cooperated with our repository by donating plants and information. We were very happy to meet them in person during their visit. We have also had visiting groups and individuals from China, Pakistan, Thailand, Japan, Great Britain, and New Zealand. We look forward to working with any who have interests in our assigned genera

## Curator's Corner

By Kim Hummer

I have been in contact with tree fruit researchers, breeders, growers, and amateurs who would like to obtain exotic woody plants. Several have expressed frustration over the quarantine system within our country. Several have alluded to "friends who have smuggled plant material in under their coats after foreign visits." This kind of plant introduction is illegal and is potentially dangerous for United States agriculture. Exotic pests have had major impact on American forest, ornamental, and orchard trees. Consider the damages of Chestnut Blight, Dutch Elm Disease, and Eastern Filbert Blight, to name a few. Now that the doors are open for trade to the east, the potential for bringing in new pests is even greater.

The Department of Agriculture knows that the quarantine system has been slow in the past. The two agencies involved, the Animal and Plant Health Inspection Service (APHIS), and the Agricultural Research Service (ARS) have been working together for some time to make the system more efficient. New facilities have been constructed. Accurate inventories of quarantined plants are now available. Plants can be tracked through the quarantine process. More technical assistance is available to test plants. Curators have been assigned for each economically important clonal and seed crop.

If you wish to bring plant material into the country, notify the assigned curator for that crop, or the Plant Introduction and Quarantine Officer at Beltsville, Maryland, in advance of plant collection. A space will be reserved for the plant in the quarantine system.

Several years will be required to process woody plant material through quarantine. Waiting this short time is a small price to pay for protection from exotic pests.

## Collections

GENUS	SEED	CLONE	TOTALS
<i>Corylus</i>	0★	108	108
<i>Fragaria</i>	40	291	331
<i>Pyrus</i>	222	727	949
<i>Ribes</i>	150	105	255
<i>Rubus</i>	464	310	774
<i>Vaccinium</i>	289	270	559
Minor Genera	393	702	1095
Other Genera	156	59	215
TOTAL			4,286

★recalcitrant. Seed undergoing germination tests.

